

## About This Manual

This chapter provides a high-level overview of the *JUNOS 5.6 Internet Software Operational Mode Command Reference: Protocols, Class of Service, Chassis, and Management* :

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## Objectives

This manual provides an overview of the JUNOS Internet software commands that you use to monitor and troubleshoot the router.

This manual documents Release 5.6 of the JUNOS Internet software. To obtain additional information about the JUNOS software—either corrections to information in this manual or information that might have been omitted from this manual—refer to the software release notes.

To obtain the most current version of this manual and the most current version of the software release notes, refer to the product documentation page on the Juniper Networks Web site, which is located at <http://www.juniper.net/>.

To order printed copies of this manual or to order a documentation CD-ROM, which contains this manual, please contact your sales representative.

## Audience

This manual is designed for network administrators who are monitoring a Juniper Networks router. It assumes that you have a broad understanding of networks in general, the Internet in particular, networking principles, and network configuration. This manual assumes that you are familiar with one or more of the following Internet routing protocols: Border Gateway Protocol (BGP), Routing Information Protocol (RIP), Intermediate System-to-Intermediate System (IS-IS), Open Shortest Path First (OSPF), Internet Control Message Protocol (ICMP) router discovery, Internet Group Management Protocol (IGMP), Distance Vector Multicast Routing Protocol (DVMRP), Protocol-Independent Multicast (PIM), Multiprotocol Label Switching (MPLS), Resource Reservation Protocol (RSVP), and Simple Network Management Protocol (SNMP).

## Document Organization

This manual is divided into several parts. Each part describes a major functional area of the JUNOS software, and the individual chapters within a part describe the software commands of that functional area.

This manual contains the following parts and chapters:

Preface, “About This Manual” (this chapter), provides a brief description of the contents and organization of this manual and describes how to contact customer support.

Part 1, “Overview,” provides an overview of the *JUNOS Internet Software Operational Mode Command Reference*, describes the user command-line interface, and provides basic strategies for monitoring and troubleshooting the router:

Chapter 1, “Command-Line Interface Overview,” describes the basics of the interface that you use to monitor the JUNOS software. The CLI is the interface that you use whenever you access the router. For information about configuring the router, or for additional information about the CLI, see the *JUNOS Internet Software Configuration Guide: Getting Started*.

Chapter 2, “Strategies for Monitoring and Troubleshooting the Router,” describes basic strategies for monitoring and troubleshooting the network and lists the commands most commonly used for monitoring and troubleshooting.

Part 2, “System Management,” describes the CLI commands used to manage the router and chassis:

Chapter 3, “Monitor and Perform System Management Functions,” describes the commands for monitoring user access and performing system management.

Chapter 4, “SNMP Monitoring and Troubleshooting,” describes the commands for monitoring user access and performing SNMP management.

Chapter 5, “M-Series Chassis Monitoring and Troubleshooting,” describes the commands for monitoring the router chassis and troubleshooting chassis problems.

Chapter 6, “T-Series Platform Monitoring and Troubleshooting,” describes the commands for monitoring the T320 router and T640 Internet routing node chassis and troubleshooting chassis problems.

Chapter 7, “Accounting Options Monitoring and Troubleshooting,” describes the commands for monitoring accounting options and troubleshooting accounting options problems.

Part 3, “Policy Framework,” describes the CLI commands used to manage firewall filters and routing policy:

Chapter 8, “Firewall Filters Monitoring and Troubleshooting,” describes the commands for monitoring firewall filters and troubleshooting filter problems.

Chapter 9, “Forwarding Options Monitoring and Troubleshooting,” describes the commands for monitoring forwarding options and troubleshooting forwarding option problems.

Chapter 10, “Routing Policy Monitoring and Troubleshooting,” describes the commands for monitoring routing policy and troubleshooting routing policy problems.

Part 4, “Class of Service,” describes the CLI commands used to manage Class of Service:

Chapter 11, “Class of Service Monitoring and Troubleshooting,” describes the commands for monitoring Class of Service (CoS) and troubleshooting CoS problems.

Part 5, “Protocols,” describes the CLI commands used to monitor the JUNOS software routing policy, unicast routing protocols, and multicast protocols:

Chapter 12, “Protocol-Independent Routing Monitoring and Troubleshooting,” describes the commands for monitoring and troubleshooting protocol-independent routing properties.

Chapter 13, “IS-IS Monitoring and Troubleshooting,” describes the commands for monitoring IS-IS and troubleshooting IS-IS problems.

Chapter 14, “OSPF Version 2 and OSPF Version 3 Monitoring and Troubleshooting,” describes the commands for monitoring OSPF and troubleshooting OSPF problems.

Chapter 15, “BGP Monitoring and Troubleshooting,” describes the commands for monitoring BGP and troubleshooting BGP problems.

Chapter 16, “RIP Monitoring and Troubleshooting,” describes the commands for monitoring RIP and troubleshooting RIP problems.

Chapter 17, “RIPng Monitoring and Troubleshooting,” describes the commands for monitoring RIPng and troubleshooting RIPng problems.

Chapter 18, “IPv6 Monitoring and Troubleshooting,” describes the commands for monitoring IPv6 and troubleshooting IPv6 problems.

Chapter 19, “IP Multicast Monitoring and Troubleshooting,” describes the CLI commands for monitoring multicast protocols and troubleshooting multicast problems.

Part 6, “MPLS Applications,” describes the CLI commands used to manage traffic engineering:

Chapter 20, “MPLS Monitoring and Troubleshooting,” describes the commands for monitoring MPLS and troubleshooting MPLS problems.

Chapter 21, “RSVP Monitoring and Troubleshooting,” describes the commands for monitoring RSVP and troubleshooting RSVP problems.

Chapter 22, “LDP Monitoring and Troubleshooting,” describes the commands for monitoring LDP and troubleshooting LDP problems.

Chapter 23, “Layer 2 VPN Monitoring and Troubleshooting,” describes the commands for monitoring Layer 2 VPNs and troubleshooting Layer 2 VPN problems.

Chapter 24, “Layer 3 VPN Monitoring and Troubleshooting,” describes the commands for monitoring Layer 3 VPNs and troubleshooting Layer 3 VPN problems.

Part 7, “Security,” describes the commands used to monitor security:

Chapter 25, “IPSec Monitoring and Troubleshooting,” describes the commands for monitoring and troubleshooting IPSec problems.

This manual also contains a glossary, a complete index, and an index of statements and commands.

## Chapter Organization

Most chapters in this manual consist of a brief description of a specific software component followed by the commands that you use for monitoring and troubleshooting that component. A table at the beginning of the chapter lists commands available for monitoring and troubleshooting the software components. Then, the commands are explained alphabetically.

The commands in this manual typically contain the following information:

**Syntax**—Describes the full syntax of the command. For an explanation of how to read the syntax statements, see “Documentation Conventions” on page xxvii.

**Description**—Describes the function of the command.

**Options**—Describes the command’s options, if there are any. For options with numeric values, the allowed range and default value, if any, are listed. For multiple options, if one option is the default, that fact is stated.

**Required privilege level**—Indicates the permissions that the user must have to view the command. For an explanation of the permissions, see the *JUNOS Internet Software Configuration Guide: Getting Started*.

**See also**—Indicates other commands or statements that might provide related or similar functionality.

Output fields—Describes each possible output field for the command, including ranges and default values. These fields are first listed alphabetically, then listed in the order in which they appear in more detail.

Sample Output—Display typical sample output for the standard, brief, summary, terse, detail, and extensive options of a command (when applicable).

## Using the Indexes

This manual contains two indexes: a complete index, which contains all index entries, and an index that contains only statements and commands.

In the complete index, bold page numbers point to pages in the statement summary chapters. The index entry for each configuration statement always contains at least two entries. The first, with a bold page number on the same line as the statement name, references the statement summary section. The second entry, “usage guidelines,” references the section in a configuration guidelines chapter that describes how to use the statement.

## Documentation Conventions

### General Conventions

This manual uses the following text conventions:

Statements, commands, filenames, directory names, IP addresses, and configuration hierarchy levels are shown in a sans serif font. In the following example, *stub* is a statement name and [edit protocols ospf area *area-id*] is a configuration hierarchy level:

To configure a stub area, include the stub statement at the [edit protocols ospf area *area-id*] hierarchy level:

In examples, text that you type literally is shown in bold. In the following example, you type the word *show*:

```
[edit protocols ospf area area-id]  
cli# show  
stub <default-metric metric>
```

Examples of command output are generally shown in a fixed-width font to preserve the column alignment. For example:

```
> show interfaces terse  
Interface      Admin Link Proto Local              Remote  
at-1/3/0       up    up    inet  1.0.0.1             --> 1.0.0.2  
at-1/3/0.0     up    up    inet  1.0.0.1             --> 1.0.0.2  
                iso  
fxp0           up    up    inet  192.168.5.59/24  
fxp0.0         up    up    inet  192.168.5.59/24
```

## Conventions for Software Commands and Statements

When describing the JUNOS software, this manual uses the following type and presentation conventions:

Statement or command names that you type literally are shown nonitalicized. In the following example, the statement name is *area*:

You configure all these routers by including the following area statement at the [edit protocols ospf] hierarchy level:

Options, which are variable terms for which you substitute appropriate values, are shown in italics. In the following example, *area-id* is an option. When you type the area statement, you substitute a value for *area-id*.

```
area area-id;
```

Optional portions of a configuration statement are enclosed in angle brackets. In the following example, the “default-metric *metric*” portion of the statement is optional:

```
stub <default-metric metric>;
```

For text strings separated by a pipe ( | ), you must specify either *string1* or *string2*, but you cannot specify both or neither of them. Parentheses are sometimes used to group the strings.

```
string1 | string2  
(string1 | string2)
```

In the following example, you must specify either broadcast or multicast, but you cannot specify both:

```
broadcast | multicast
```

For some statements, you can specify a set of values. The set must be enclosed in square brackets. For example:

```
community name members [ community-ids ]
```

The configuration examples in this manual are generally formatted in the way that they appear when you issue a show command. This format includes braces ( { } ) and semicolons. When you type configuration statements in the CLI, you do not type the braces and semicolons. However, when you type configuration statements in an ASCII file, you must include the braces and semicolons. For example:

```
[edit]  
cli# set routing-options static route default nexthop address retain  
[edit]  
cli# show  
routing-options {  
  static {  
    route default {  
      nexthop address;  
      retain;  
    }  
  }  
}
```

Comments in the configuration examples are shown either preceding the lines that the comments apply to, or more often, they appear on the same line. When comments appear on the same line, they are preceded by a pound sign (#) to indicate where the comment starts. In an actual configuration, comments can only precede a line; they cannot be on the same line as a configuration statement. For example:

```
protocols {  
  mpls {  
    interface (interface-name | all); # Required to enable MPLS on the interface  
  }  
  rsvp {  
    interface interface-name; # Required for dynamic MPLS only  
  }  
}
```

The general syntax descriptions provide no indication of the number of times you can specify a statement, option, or keyword. This information is provided in the text of the statement summary.

## List of Technical Publications

Table 1 lists the software and hardware books for Juniper Networks routers and describes the contents of each book.

**Table 1: Juniper Networks Technical Documentation**

Book	Description
<b>JUNOS Internet Software Configuration Guides</b>	
<i>Getting Started</i>	Provides an overview of the JUNOS Internet software and describes how to install and upgrade the software. This manual also describes how to configure system management functions and how to configure the chassis, including user accounts, passwords, and redundancy.
<i>Interfaces and Class of Service</i>	Provides an overview of the interface and class-of-service functions of the JUNOS Internet software and describes how to configure the interfaces on the router.
<i>MPLS Applications</i>	Provides an overview of traffic engineering concepts and describes how to configure traffic engineering protocols.
<i>Multicast</i>	Provides an overview of multicast concepts and describes how to configure multicast routing protocols.
<i>Network Management</i>	Provides an overview of network management concepts and describes how to configure various network management features, such as SNMP, accounting options, and cflowd.
<i>Policy Framework</i>	Provides an overview of policy concepts and describes how to configure routing policy, firewall filters, and forwarding options.
<i>Routing and Routing Protocols</i>	Provides an overview of routing concepts and describes how to configure routing, routing instances, and unicast routing protocols.
<i>VPNs</i>	Provides an overview of Layer 2 and Layer 3 Virtual Private Networks (VPNs), describes how to configure VPNs, and provides configuration examples.
<b>JUNOS Internet Software References</b>	
<i>Operational Mode Command Reference: Interfaces</i>	Describes the JUNOS Internet software operational mode commands you use to monitor and troubleshoot interfaces on Juniper Networks M-series and T-series routers.
<i>Operational Mode Command Reference: Protocols, Class of Service, Chassis, and Management</i>	Describes the JUNOS Internet software operational mode commands you use to monitor and troubleshoot most aspects of Juniper Networks M-series and T-series routers.
<i>System Log Messages Reference</i>	Describes how to access and interpret system log messages generated by JUNOS software modules and provides a reference page for each message.
<b>JUNOScript API Documentation</b>	
<i>JUNOScript API Guide</i>	Describes how to use the JUNOScript API to monitor and configure Juniper Networks routers.
<i>JUNOScript API Reference</i>	Provides a reference page for each tag in the JUNOScript API.
<b>JUNOS Internet Software Comprehensive Index</b>	
<i>Comprehensive Index</i>	Provides a complete index of all JUNOS Internet software books and the <i>JUNOScript API Guide</i> .
<b>Hardware Documentation</b>	
<i>Hardware Guide</i>	Describes how to install, maintain, and troubleshoot routers and router components. Each router platform (M5 and M10 routers, M20 router, M40 router, M40e router, M160 router, T320 router, and T640 routing node) has its own hardware guide.
<i>PIC Guide</i>	Describes the router Physical Interface Cards (PICs). Each router platform has its own PIC guide.



## Documentation Feedback

We are always interested in hearing from our customers. Please let us know what you like and do not like about the Juniper Networks documentation, and let us know of any suggestions you have for improving the documentation. Also, let us know if you find any mistakes in the documentation. Send your feedback to [techpubs-comments@juniper.net](mailto:techpubs-comments@juniper.net).

## How to Request Support

For technical support, contact Juniper Networks at [support@juniper.net](mailto:support@juniper.net), or at 1-888-314-JTAC (within the United States) or 408-745-9500 (from outside the United States).



